



#21 (c)  $a_n = (-1)^{n+1} \frac{n+1}{n+2}$

$$a_{2n} = \frac{2n+1}{2n+2} = 1 - \frac{1}{2n+2} \rightarrow 1$$

$$\text{한 } \epsilon > 0 \text{ 가 있어 } \lim_{n \rightarrow \infty} a_{2n} = 1 \text{ 이다}$$

그러나

$$a_{2n+1} = -\frac{2n+2}{2n+3} = -1 + \frac{1}{2n+3}$$

$$\text{은 한 } \epsilon > 0 \text{ 가 있어 } \lim_{n \rightarrow \infty} a_{2n+1} = -1 \text{ 이다}$$

$$\textcircled{1} \sup_{n \geq 1} a_n = \lim_{n \rightarrow \infty} a_{2n} = 1$$

$$\textcircled{2} \inf_{n \geq 1} a_n = \lim_{n \rightarrow \infty} a_{2n+1} = -1$$

$$\textcircled{3} \lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \sup_{k \geq n} a_k = 1$$

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \inf_{k \geq n} a_k = -1.$$

$$(d) a_n = n^{1+(-1)^n} \quad (n=1, 2, \dots)$$

$$1 \leq a_n < \infty \text{ 이며 } \lim_{n \rightarrow \infty} a_{2n} = (2n)^2 = \infty \text{ 이다.}$$

$$\textcircled{1} \sup_{n \geq 1} a_n = +\infty, \quad \inf_{n \geq 1} a_n = 1$$

$$\textcircled{2} \lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \sup_{k \geq n} a_k = +\infty$$

$$\lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \inf_{k \geq n} a_k = 1. \quad a \in \mathbb{R}.$$